for fuel on oil, and not on coal. The advantage of this arrangement of being free from ballast need scarcely be expatiated upon; when the oil is used up, water can be pumped into its place. Both ships will also be fitted with cages and tanks for bringing home live seals and penguins. Moreover, the *Aurora* will have a gyroscopic compass, which will therefore not be affected by magnetism in the ship. The expedition will be fitted with a wireless installation—one of about 500 miles' radius. But more useful still, two sledges driven by aëroplane propellers, with aëroplane engines, and an aëroplane with clipped wings to glide over the ice, are being taken. The team of trained dogs numbers 200. The expedition will be equipped for two years, and is to be known as "The Imperial Antarctic Expedition." The minimum cost is 50,000*l.*, and this amount has been provided by the generosity of a friend. In order to equip the expedition with full efficiency, however, 60,000*l.* or 70,000*l.* would be required. No public appeal is to be made for subscriptions to make up the additional amount, but contributions for this purpose will be welcomed and will be of service.

The following statement as to scientific work contemplated was made by Sir Ernest Shackleton on Monday:—

> No one knows whether the great plateau dips gradually from the pole towards the Weddell Sea, and no one knows whether the great Victoria chain of mountains, which has been traced to the pole, extends across the continent and links up with the Andes. The solving of the problem is of intense interest to geographers all over the world, and the discovery of the great mountain range, which we assume is there, will be one of the biggest geographical triumphs of the time.
>
> The geological results will be of the greatest interest to the scientific world. The expedition will at its winter quarters make geological collections, also typical rocks will be taken on the journey if we come across exposed rocks when crossing the mountain ranges. One ship will land parties for the purpose of making geological collections on the west side of the Weddell Sea, and the ship will at the same time trace, if possible, the continuation of Graham Land southwards.
>
> The expedition will take continuous magnetic observations from the Weddell Sea right across the pole, and the route followed will lead towards the magnetic pole and make an ideal method of determining the general dip of the magnetic needle. This magnetic work has a direct bearing on economic conditions, in that an absolutely true knowledge of magnetic conditions is of use to ships in navigable waters. I also propose to set up a magnetic observatory at winter quarters and take continuous magnetic observations throughout the winter. On my last expedition we could only take field magnetic observations, as, owing to lack of money in the first place, I could not afford to provide a large magnetic equipment, though we did important work, as one of the parties reached for the first time the south magnetic pole.
>
> The meteorological conditions would be carefully studied, and would help to elucidate some of the peculiar problems of weather that at present are only dimly recognised as existing. Continuous meteorological observations, both at winter quarters and on the journey across, are of extreme importance, and the results can be correlated with the observations of the last three expeditions in the Antarctic.
>
> Biological work will be thoroughly carried on, and the distribution of fauna and plant life will be studied. Both ships will be equipped for dredging and sounding.
>
> All branches of science will be most carefully attended to, and the net result scientifically ought to be a large increase to human knowledge, but, first and foremost, the crossing of the polar continent will be the main object of the expedition.

NOTES.

THE Academy of Sciences of Bologna has elected Prof. Silvanus P. Thompson as a corresponding member in the class of physical science.

AT the last meeting of the Academy of Sciences in St Petersburg Sir William Ramsay was unanimously elected an honorary member of the academy; he was previously a corresponding member.

SIR HOWARD GRUBB, F.R.S., has been appointed scientific adviser to the Commissioners of Irish Lights, in succession to the late Sir Robert Ball, who held the position for the past twenty years.

IN a flight from the naval aërodrome at Fréjus, France, on December 27, M. Legagneux, succeeded in reaching a height of 20,300 ft., which is the greatest altitude yet attained with an aëroplane.

THE next grants from the Elizabeth Thompson Science Fund will be made in February, 1914. Applications should be sent to the secretary, Dr. Charles S. Minot, Harvard Medical School, Boston, Mass., before February 1.

WE regret to see the announcement of the death, on December 26, at fifty-three years of age, of Mr. W. Popplewell Bloxam, formerly professor of chemistry in Presidency College, Madras, and the author of a number of reports and papers on the production and chemistry of indigo.

MR. W. LAWRENCE BALLS, botanist to the Egyptian Government, Department of Agriculture, has just left the service of the Government, his agreed term of years having expired, and is returning to Cambridge to work up unpublished data on cotton accumulated since his appointment to the staff of the Khedivial Agricultural Society as cryptogamic botanist in 1904, and in the post he has now vacated.

MEN who have been trained at the Royal Botanic Gardens, Kew, occupy posts in botanic gardens in most parts of the world. The following new appointments of members of the gardening staff at Kew are announced in the *Kew Bulletin*:—Mr. G. S. Crouch, to be assistant director of horticulture in the Egyptian Department of Agriculture; Mr. T. H. Parsons, to be curator of the Royal Botanic Gardens, Peradeniya, Ceylon, in succession to Mr. H. F. Macmillan, who has been appointed superintendent of horticulture in the department of agriculture, Ceylon; Mr. C. E. F. Allen, to be curator of the Botanic Garden, Port Darwin, Northern Territory, South Australia, in succession to Mr. N. Holtze, deceased.

PROF. E. B. TITCHENER asks us to announce that a prize of one hundred dollars is offered for the best paper on the availability of Pearsons formulæ for psychophysics. The rules for the solution of this problem have been formulated in general terms by Dr. W. Brown. It is now required (1) to make their formulation specific, and (2) to show how they work out in actual practice. This means that the writer must show the steps to be taken, in the treatment of a complete set of data, for attainment in every case of a definite result. The calculations should be arranged with a view to practical application—*i.e.* so that the amount of computation is reduced to a minimum. Papers in competition for this prize will be received not later than December 31, 1914, by Prof. E. B. Titchener, Cornell Heights, Ithaca, N.Y., U.S.A. Such papers are to be marked only with a motto, and are to be accompanied by a sealed envelope, marked with the same motto, and containing the name and address of the writer. The prize will be awarded by a committee consisting of Profs. William Brown, E. B. Titchener, and F. M. Urban.

THE use of distributed inductance in telephone cables which was advocated many years ago by Mr. Oliver Heaviside, and was put into practice more recently by Pupin, has not only resulted in great economies in copper on long-distance telephone lines, but also has enabled submarine telephone cables to be brought into use for far greater distances than formerly. The most recent achievement in this direction is the laying last month of a cable sixty-four nautical miles in length between Nevin, in Carnarvonshire, and Howth, about eight miles from Dublin. Hitherto telephony between England and Ireland has been carried on through a cable twenty-four nautical miles in length between Port Mora (near Portpatrick) and Donaghadee, in connection with long land lines on both sides of the Channel. The new cable, which was manufactured by Siemens Bros. and Co., has four conductors weighing 160 lb. per nautical mile, and insulated with a special gutta-percha with a low leakance, weighing only 150 lb. per nautical mile. At distances of one nautical mile apart, inductance coils are inserted in each of the four cores. These are long narrow double-wound coils, each with an inductance of about 100 millihenrys. Their construction is such that they are enclosed in the gutta-percha covering in the same way as the cable itself, and the armouring is carried right over them.

IN the South American Supplement of *The Times* for December 30, attention is again directed to the possible effects of earthquakes on the Panama Canal. While retracing much of the ground covered in our former Notes on the subject, Prof. J. Stuart refers to several points that are worthy of consideration. The general belief as to the safety of the massive concrete walls of the locks is based on the assumption that the locks have been laid upon solid rock. This is the case with the locks at Pedro Miguel and Miraflores, but those at Gatun are founded on beds of argillaceous sandstones, which were first described as indurated clays. Prof. Stuart points out that the fears as to the Gatun dam being opened by fissures are probably groundless, for the San Leandro dam which stores the water supply of Oakland was uninjured by the San Francisco earthquake. He refers in conclusion to the possible effects of the excavations. More than 200 million cubic yards of material have been removed from the various cuttings and deposited on the dams and elsewhere, and he suggests that this redistribution of stresses in the earth's crust might facilitate the occurrence of earthquakes.

THE English Forestry Association, of which Lord Clinton is president, and Mr. M. C. Duchesne (Farnham Common, Slough, Bucks) secretary, proposes to hold a forest exhibition in London in 1914. The object of the exhibition is to encourage English timber industries. Commercially the private forest owner cannot usually hope to obtain the rate of interest he looks for, on anything but short-rotation copse, and it is exactly underwood that has fallen so disastrously in price. The English Forestry Association has strong hopes of reviving the failing industry in wooden barrel hoops. It seems possible also to get back to better prices for firewood. By burning firewood in a properly constructed stove a heating power can be obtained equal to that of coal in the ordinary domestic fireplace—an open stove with the fire showing, and a healthy mixture of both radiant and convection heat. If such stoves came into use there would be a better demand for firewood. But the experience of other countries shows that it is the working with a large scheme of State forestry that is the saving feature of private forestry, and the forestry exhibition would help to direct attention to the fact that the Development Commission, after three and a half years, has failed to carry out its Act and initiate State forestry in Britain, while the slow progress in Ireland is exciting adverse comment.

MAJOR H. G. JOLY DE LOTBINIÈRE has contributed to *The Quarterly Review* for October a valuable and timely article on the position of forestry in England and abroad, in which he reviews the principal timber resources of the world, and the steps that have been taken in England and elsewhere to provide for the future. As he points out, experts in every country are agreed that the world's supply of timber is rapidly diminishing, and that unless vigorous steps are taken in the afforestation of suitable waste lands a shortage of material must be experienced long before the close of the present century. The author indicates in a general way the lines on which the work of afforesting the sixteen million acres of mountainous and heath land in this country should be proceeded with, and urges the necessity for immediate action.

THE trustees of the British Museum have acquired recently a unique gold coin of extraordinary interest. It is the only known example of the gold coinage of the Anglo-Saxon King Offa (A.D. 757–96); and its value lies in the fact that, though struck by a Christian King, it bears a Mohammedan inscription in Arabic. Offa agreed to pay a tribute in gold of Peter's Pence, and he probably used the predominating gold currency of his day as the best model for his purpose, adding the inscription "Offa rex" to that already existing on an Arabic dinar which was coined about twenty years before his time.

THE volume of the Transactions of the Bristol and Gloucestershire Archæological Society for 1912 is devoted to a descriptive catalogue of the printed maps of Gloucestershire, 1577–1911, by Mr. T. Chubb, of the Map Room, British Museum. The series begins with the map dated 1577 in Christopher Saxton's "Atlas of England and Wales," published in 1579, and is followed by that by Peter Keer, in his collection of twenty-eight maps of his "Counties of England and Wales," 1599. Thence the series of maps are continuous down to the present day. Among recent catalogues of county maps those by Sir H. G. Fordham for Hertfordshire, Mr. W. Harrison for Lancashire, and Mr. T. Chubb for Wiltshire are the most important. Mr. Chubb's catalogue is an excellent piece of work, and is provided with an admirable series of reproductions of the more important maps. It is to be hoped that other local archæological societies will follow this model in cataloguing the maps of the English counties.

THAT the use of coloured photography will prove to be an important addition to the resources of the anthropologist is clearly proved by the admirable series of photographs of the pagan races of the Philippine Islands, illustrating a paper on these people by Mr. Dean C. Worcester, in the November issue of *The National Geographic Magazine*. He gives a useful account of the relations between the American authorities and these primitive tribes, and of the attempts which are being made to bring them within the pale of civilisation by roads, schools, police, and the regulation of trade. The danger is that the process of reclamation may prove too effective, and that as they become civilised they will degenerate and decay. This consideration is no doubt present in the minds of the authorities, and they are unlikely to press our modern civilisation on these races further than is consistent with their preservation.

A REPORT of sleeping sickness in the Island of Principe, by Surgeon-Captain Bruto da Costa, has been translated into English by Lieut.-Col. Wyllie, and published by Messrs. Baillière, Tindall, and Cox. It is believed that neither the disease nor the transmitting fly, *Glossina palpalis*, are indigenous in the island, but that the fly was introduced about 1825 with cattle from the gaboon. Atoxyl was found useless either as a prophylactic or as a cure of the disease; it was useful only as a tonic, prolonging life in animals experimentally infected. It is claimed that a considerable decrease in the incidence of the disease has been effected by measures consisting mainly of draining swamps, felling timber, clearing the undergrowth, and exterminating pigs in the regions infested by the tsetse-flies. It is well known that *G. palpalis* breeds near water, but the author suggests that it cannot do so under exposure to the direct light and heat of the sun, hence the importance of keeping the borders of marshes and brooks free from all vegetation or overhanging shade. The pigs are believed to afford the chief sustenance of the tsetse in the bush, and also to carry the flies about from place to place.

IN a memoir entitled "Botanical Features of the Algerian Sahara," issued as Publication No. 178 of the Carnegie Institution of Washington, Dr. W. A. Cannon gives an extremely interesting account of his observations in southern Algeria and the western portion of the Sahara. The chief object of his tour, which extended over about six months, and included a journey of about a thousand miles through the more arid portions of the country, was to investigate the climatic and soil conditions of this region with special reference to the root-habits of the more striking species of the flora. The author's work on desert plants in North America enables him to draw interesting comparisons between the widely separated arid regions of Arizona and Algeria, and the concluding portion of this valuable memoir, which is illustrated by thirty-six fine collotype plates, gives one of the clearest and most complete accounts of desert vegetation that has yet been published. One of the most striking results of Dr. Cannon's investigations is his demonstration of the fact that, contrary to what might have been expected, the prevailing type of root in desert plants is neither that with a deep main axis (tap-root) nor that which spreads out horizontally near the soil surface (as found in most Cacti), but a generalised type which is adapted to a wider range of conditions. The Algerian desert is more intensely arid than Arizona, and while fleshy plants like the Cacti are a striking feature of the North American deserts, such plants are entirely absent in southern Algeria.

A PAPER by Mr. T. Thorne Baker, read on December 10 before the Royal Society of Arts includes an account of physiological effects of high-frequency currents. It was stated that the upper part of the plant is negative electrically as compared with the roots, and therefore the minute hairs on the leaves and stems would act as collectors to collect atmospheric electricity, which is usually positive in character. The fact that the plant itself acts as a battery, and possesses two poles of opposite sign, was taken to indicate that these feeble differences of potential are of intrinsic use in the natural processes of the plant, and it was stated that increase of growth can be obtained by the electric current. Experiments were described showing the effect of electric discharge on various organisms. The red variety of the American gooseberry blight was not killed by the discharge except where there had been a preliminary treatment with soluble sulphide. Cheese mites, however, were readily killed. Other results were quoted showing the effect of electric stimulus on animal life. It was stated that chickens will grow under such stimulus at about double the normal rate, whilst the mortality is considerably less than usual. Considerable care, however, is necessary in adjusting the ratio of current to voltage, the frequency of oscillations, and the quantity of electricity to the dimensions of the culture house.

THE report of the Behar Planters' Association Indigo Research Station at Sirsiah for the year 1912–13, recently received, possesses the interest of being the last of its series. It includes a brief recapitulation by Mr. C. Bergtheil of the work done at this station during recent years, as well as an account of the work of the year under review, followed by an appendix of much interest by Mr. F. R. Parnell, reviewing the botanical work carried out at Sirsiah since October, 1909, for which he has been responsible. This work, it is explained, has been mainly devoted to the improvement of the plant grown, more especially in the direction of the selection of pure lines of the already cultivated plant possessing greater economic value than the ordinary mixed crop. This review of work done will repay perusal, and the reader will recognise in it a modest record of good work faithfully and conscientiously performed. To those, however, who at a time when the natural indigo industry as a whole is being hardly pressed by the competition of the synthetic indigo-maker, find their sympathies still with the Behar planter, the text of this ultimate Sirsiah report will supply food for thought that is not altogether comforting. Of the two Indigoferas that are mainly grown in Behar—*I. sumatrana,* which displaced *I. articulata* about a century ago, and *I. arrecta,* the introduction of which is a matter of only a dozen years ago—a rather disquieting account is given. As to the former, there is a record of miserable crops traceable, Mr. Bergtheil believes (p. 6), to the sowing of inferior seed; as to the latter there is a disheartening history by Mr. Parnell (p. 24) of "disease," which, so far, it has not been possible to attribute to fungal, insect, or bacterial attack, or to explain as the result of defective culture.

In the Journal of the Franklin Institute (October, No. 4) appears an important paper by Mr. Frank K. Cameron, of the Bureau of Soils, U.S. Department of Agriculture, on kelp and other sources of potash. After briefly reviewing the fertiliser problems of the United States, Mr. Cameron gives an account, illustrated by many photographs, of the movement recently started to utilise the giant "kelps" of the Pacific coast as a source of potash, which promises to develop into a very large and important industry. These giant kelps occur in numerous beds or groves, often of a vast extent, and are characterised by an exceptionally high content of potassium, five times on the average that of the better-known Atlantic algæ. They are said to form "an ample, perennial possible source of potash for the present needs of the United States." Until recently the harvesting of the kelp on a sufficiently large scale to make it a commercial possibility appeared the chief difficulty, but ingenious mechanical harvesters have been devised to overcome this. The costs of harvesting and utilisation are gone into in some detail, and it is pointed out that several soundly financed companies have already started operations on the large scale from which good results are anticipated.

In an interesting article contributed to the Proceedings of the R. Academy of Amsterdam (vol. xv.) by Dr. C. Braak an attempt is made to show that by means of the connection perceptible between barometric pressure and rainfall in the Indian Archipelago it is possible to make "a long-range weather forecast for the east monsoon in Java." With respect to deviations of air-pressure, the author states that Java has a special advantage, because the variations of climate there are determined by the variations of pressure in North Australia, the latter being characterised by an extraordinary regularity. A barometric curve plotted for several years for Port Darwin shows some very regular series of waves, from which it appears that the time which elapses from minimum to maximum is one year, from maximum to minimum two years, the period being exactly three years. These regular periods are particularly adapted to forecast air-pressure a considerable time in advance. On the principle upon which the scheme has been based it is claimed that it would have been possible to forecast the sign of the rainfall departure in Java for many of the years dealt with in the investigation. Attention is directed to the fact that in the Port Darwin curve the epoch of the maximum and minimum seems to be entirely controlled by the terrestrial seasons; cosmical influences, instead of causing barometric oscillations, seem to disturb them (namely during the sun-spot maximum).

The Journal of the Institution of Electrical Engineers for December 15 contains an extremely interesting paper by Mr. S. Evershed on the characteristics of insulation resistance. Mr. Evershed, as the result of a long course of experimental research, has come to the conclusion that the conductance through insulators of the "absorbent" class, such as impregnated paper, fibre, or cloth, is entirely due to the moisture which they contain. Curves are given to show that the insulation resistance falls as the voltage increases—or, as Mr. Evershed puts it, does not follow Ohm's law. If, on the other hand, the material is either perfectly dry or absolutely sodden with moisture, the insulation is the same within wide limits of potential difference. Another interesting fact ascertained is that the conductance through an insulator containing a certain quantity of water is far less than the conductance through the same quantity and thickness of water. To account for this, Mr. Evershed puts forward the hypothesis, supported by an experimental "model," that the moisture is distributed unequally in the dielectric—that there are a number of "blind alleys," and, in fact, only a very small proportion of the absorbed water is utilised in forming the leakage paths. In the discussion, Prof. A. Schwartz suggested that the distribution of the moisture in the dielectric followed a similar law to the distribution of sap in plants.

"Let Us Have Our Calculus Early." Such is the title of an article in the Bulletin of the American Mathematical Society for October by Prof. E. B. Wilson, written professedly as a review of Mr. J. W. Mercer's recent "Calculus for Beginners." Writing of the great decline which has taken place in the sway of mathematics over collegiate education, Prof. Wilson points out that this has occurred at a time when the need of mathematical knowledge in all branches of science and technology is greater than it ever was in the past. "One of the main troubles with us is that we do not select the right subjects to teach in the early collegiate years. There is no sense in giving the freshman a considerable course in advanced algebra. The subject is abstract, and deals with topics and ideas relatively unimportant for the student. Yet advanced algebra is often taught as a pre-requisite to calculus. It is unfortunate to force the freshman through an extended course in analytic geometry." This latter reference makes one wonder what Prof. Wilson would think of our recent epidemic of "projective geometries," good, bad, and indifferent, which may teach pupils to copy out proofs of stereotyped bookwork like Pascal's or Brianchon's theorems, but will never enable them to attempt a problem in mechanics involving a conic, cycloid, or catenary except by writing down the equation of the curve and becoming involved in hopelessly intractable formulæ from which the answer "may be obtained" —perhaps by the examiner, but with little credit and no educational value to the candidate.

IN connection with the recent International Congress of Refrigeration held at Chicago and Washington, the Smithsonian Institution has directed attention to the first U.S. patent for the manufacture of ice, granted on May 6, 1851, to John Gorrie, of New Orleans, and now on exhibition in the U.S. National Museum. The patent fully describes the method of compressing air to a small part of its bulk, abstracting the heat liberated by a jet of water, allowing the air to re-expand in an engine, whereby the expansion is utilised and helps in the working of the condensing pump, injecting an uncongealable liquid into the engine, and circulating it as a medium to absorb heat from the water being frozen, and to give it out to the expanded air. "The employment of the engine for the purpose of rendering the expansion of the condensed air gradual, in order to obtain its full refrigeratory effects, and, at the same time, render available the mechanical force with which it tends to dilate to aid in working the condensing pump, irrespective of the manner in which the several parts are made, arranged, and operated" is a remarkably accurate description of the method for the time. Short of the actual recognition of the equivalence of work and heat, due to Mayer in 1844, the inventor's ideas could scarcely have been clearer. Gorrie published in 1844 several articles on the subject in *The Commercial Advertiser* of Apalachicola, Fla., a re-examination of which might be of interest from the point of view of the history of the dynamical theory of heat and the law of the conservation of energy. These papers, together with the original of the patent, have been deposited in the U.S. National Museum.

PART vi. of vol. xxi. of the Memoirs of the Indian Meteorological Department contains a discussion by Dr. G. C. Simpson of the potential gradient of atmospheric electricity at Simla. The data were derived from a Benndorf electrograph between May, 1907, and May, 1910, with an interruption between October and November, 1908, when the site of the instrument was altered. There are two tables showing respectively the annual variation of the potential gradient, and its diurnal variation for the twelve months of the year, for four quarters and for the year as a whole. Two plates show the results graphically. Use is made only of the days free from large irregular disturbances, numbering altogether 440. Owing to the non-existence of any sufficiently extensive level ground in Simla, it was impossible to deduce absolute values appropriate to a site in the open. The unit employed is thus an arbitrary one. The most remarkable feature is the frequent occurrence of negative potential in fine weather during May and June. This Dr. Simpson attributes to the presence of large quantities of dust in the atmosphere during the warm, dry weather which precedes the setting in of the monsoon. The number of days available, especially in July and August, is scarcely sufficient to give smooth diurnal inequalities for the individual months of the year; but there are obviously as a rule two maxima and two minima, one pair in the forenoon, the other in the afternoon. The morning minimum is usually the principal one, especially towards mid-winter, but in April, May, and June—especially June—the minimum in the early afternoon is the more prominent. On the average of the years included, February gave the highest and June the lowest mean value of the potential.

A NEW method of preparing aqueous colloidal solutions of metals is described by H. Morris-Airey and J. H. Long in the Proceedings of the University of Durham Scientific Society (vol. v., part ii., pp. 68 and 113), which is based on the use of high-frequency alternating currents passing between electrodes of the metal immersed in water. It is possible to vary the range of frequency of the current between very wide limits, and in this way it has been shown that the colour supposed to be characteristic of the colloidal solutions of metals is a result of the special conditions of the discharge. Thus gold, for instance, on altering the frequency, can be made to give a red, blue, or purple solution; in the red solution the particles are negatively charged, and in the blue solution positively charged. The purple solutions contain both kinds of particles. The red solution is converted into the blue by the action of an electrolyte or electric field.

WE learn from *Engineering* for December 26 that Prof. G. Benoit and Mr. Woernle are engaged on an investigation of the strength and durability of wire ropes. The research, which they are conducting in the laboratory for hoisting-machinery of the Technical High School at Karlsruhe, will occupy them for some time, but as the experiments are fairly conclusive regarding the deleterious influences of twisting, the preliminary results have been published. Twisted ropes have been proved by these experiments to be much less safe than the untwisted wires, even if the wires be annealed, thus demonstrating that the twisting leaves considerable strains in wire ropes, and especially on those made of high-class steels, which are chiefly used in mine haulage and winding. The method of experimenting consisted in applying the wires and ropes to a pulley which was turned to and fro through an angle of about 90° at the rate of 1000 turns per hour, thus bending and unbending the wires always in the same direction. Further experiments with alternating bending to different radii, &c., are now being made.

THE report of the Clifton College Scientific Society for the year 1912–13 has been received. It contains information of the work done during the session by the various sections among which the work of the society is divided. We notice among the contents an interesting calendar of bird observations made near Clifton, from January to July, 1913, to which a note is appended, stating that the Royal Agricultural Show enclosures on Clifton Downs greatly interfered with birds and observers during the season.

WE have received from the Carnegie Institution of Washington two volumes prepared under the auspices of the department of historical research. One, by Mr. David W. Parker, is a "Guide to the Materials for United States History in Canadian Archives"; the other, by Prof. Herbert E. Bolton, is a similar guide concerned with materials for the same purpose in the principal archives of Mexico. Both volumes belong to a series, to which we have directed attention on previous occasions, representing a systematic endeavour by the department of historical research to make more easily available for authors and students the materials contained in foreign archives necessary in studying the history of the United States. Volumes have appeared already dealing with Cuba, Spain, Great Britain, Italy, and Germany, and others concerned with the archives of Paris, Switzerland, the Netherlands, and Sweden are in course of preparation.

OUR ASTRONOMICAL COLUMN.

COMET 1913*f* (DELAVAN).—Prof. H. Kobold communicates, in a Kiel Circular, No. 144, dated December 21, the elements and ephemeris of Delavan's comet (1913*f*), the former being based on observations made on December 17, 18, and 19. The elements are as follows:—

Elements.

$T = 1914$ March 2·3211 M.T. Berlin.
$\Omega = 126^\circ\ 32{\cdot}6'$
$\omega = \ \ 7\ \ 40{\cdot}1$
$i = 13\ \ \ 4{\cdot}6$
$\log q = 0{\cdot}04526$

Ephemeris for 12h. M.T. Berlin.

	R.A. h. m. s.		Decl. ° ′		Mag.
Dec. 31	2 54 5	...	−5 18·4		
Jan. 1	53 44	...	5 4·9		
2	53 28	...	4 50·8		
3	53 12	...	4 36·1		
4	53 1	...	−4 20·9	...	10·5

A note in *The Times* of December 24 states that the comet will approach the earth and sun for the next two months, and while its brightness will be considerably increased, the object is not expected to be visible to the naked eye. Its south declination will be maintained until about the middle of January. The positions of the comet are in the constellations of Eridanus and Cetus.

AN AID TO TRANSIT CIRCLE OBSERVERS.—Transit observers are only too well aware of the time occupied in reading off chronograph strips, the work involved, even when assisted by a writer, being equal to that of making the observations themselves. Any suggestion of a method of reducing the labour will be welcomed provided it can be thoroughly relied upon. Prof. E. Grossmann, in *Astronomische Nachrichten*, No. 4701, describes a very practical arrangement which seems very efficient and simple. He adopts the reading apparatus constructed by Th. von Oppolzer, and works this in conjunction with an ordinary typewriter. All the observer has to do is to place the movable thread on the observed signal on the tape and the press of a key is sufficient to write automatically the scale reading underneath. In the paper Prof. Grossmann describes the apparatus in some detail, and accompanies the text with two illustrations. Messrs. Favargar and Co. in Neuchatel were entrusted with the arranging of the complete apparatus.

STANDARD WAVE-LENGTH DETERMINATIONS.—No. 75 of the Contributions from the Mount Wilson Solar Observatory is devoted to the second paper by Messrs. St. John and L. W. Ware, entitled "Tertiary Standards with the Plane Grating: the Testing and Selection of Standards." In this paper the authors have examined the international secondary standards from λ4282 to λ5506 as to their consistency among themselves, and have determined the wave-lengths in international units of a series of 198 lines in the arc spectrum of iron from λ4118 to λ5506. The region from λ5371 to λ5506 is common to the 1912 and 1913 investigations, but an entirely new series of plates was made for the common region. The Pasadena plates were taken with the 30-ft. spectrograph, while the Mount Wilson plates were secured with the 75-ft. Littrow spectroscope used in conjunction with the 150-ft. tower telescope. The communication, which is published in considerable detail, is another example of the high accuracy attained in the Mount Wilson determinations. It is interesting to note that the difference between the heights above sea-level of Pasadena (244 m.) and Mount Wilson (1794 m.) is responsible for changes in relative wave-length determinations at the two stations. Numerous important conclusions are summed up at the end of the paper.

PRIZE AWARDS OF THE PARIS ACADEMY OF SCIENCES FOR 1913.

Geometry.—The Francœur prize to A. Claude, for the whole of his astronomical work; the Bordin prize was not awarded, no memoir on the question proposed having been received.

Mechanics.—The Montyon prize to M. Sauvage; the Poncelet prize to Maurice Leblanc, for his work in mechanics.

Navigation.—The extraordinary prize for the Navy is divided between Le Prieur (1800 francs), Geynet (1800 francs), Violette (1800 francs), and R. E. Godfroy (600 francs); the Plumey prize to M. Risbec, for his work on the propulsion and stability of ships.

Astronomy.—The Pierre Guzman prize is not awarded; the Lalande prize to J. Bosler, for his researches on the sudden variations of terrestrial magnetism and their connection with disturbances in the sun; the Valz prize to Prof. Fowler, for his researches in spectroscopy; the G. de Pontecoulant prize to M. Sundmann, for his researches on the problem of three bodies.

Geography.—The Tchihatchef prize to Col. Peter Kusmitch Kozlov, for his explorations and publications on Central Asia; the Gay prize to Dr. Mocquart, for his memoirs on tropical reptiles.

Physics.—The Hébert prize to Prof. Swingedauw, for his researches on explosive potential and electrotechnics; the Hughes prize to Jean Becquerel, for his work in magneto-optics; the De Parville prize to Prof. Rothé, for the whole of his researches in physics; the Gaston Planté prize to R. V. Picou, for his work in the field of electrical industry; the Kastner-Boursalt